APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/696,546	10/28/2003	Martin R. Watts	JPM-057 C1	7838

70813 7590 07/23/2008	EXAMINER
GOODWIN PROCTER LLP	KHATTAR, RAJESH
901 NEW YORK AVENUE, N.W.	
WASHINGTON, DC 20001	

ART UNIT	PAPER NUMBER
3693	

NOTIFICATION DATE	DELIVERY MODE
07/23/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS,
WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>14 April 2008</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-8</u> is/are pending in the application.

    4a) Of the above claim(s) <u>1</u> is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>2-8</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>4/14/2008</u>.

4)☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____

5)☐ Notice of Informal Patent Application

6)☐ Other: _____

DETAILED ACTION

Acknowledgements

This office action is in response to Applicant's communication filed on 4/14/2008.

Claims 2-4 and 6 have been amended. Claim 1 was previously canceled. As such,

claims 2-8 are pending in the application.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 2, 4 are rejected under 35 U.S.C. 112, second paragraph, as being

indefinite for failing to particularly point out and distinctly claim the subject matter which

applicant regards as the invention. Examiner is unclear about the term "employing a

volatility premium process." Particularly, Examiner is unclear as to what active steps

are associated with the volatility premium process.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over

Daughtery, US Patent No. 6,263,321 in view of a book by Neil A. Chriss titled "Black-

Scholes and Beyond. Option Pricing Models" in view of Pilipovic, US Patent No.

6,456,982 in view of Yuguchi, US Patent No. 3,673,521 and further in view of

Applicant's admitted prior art. Daughtery discloses a method for generating a premium

for an option, comprising:

provieidng the average volatility of the asset by employing historical or market

data (col. 7, lines 1-8);

providing the *volatility of volatility* of the asset by employing historical data (col. 7,

lines 1-8);

determining an option for each vertical slice by employing a volatility premium

process (col. 11, lines 35-col. 12, lines 13; Daughtery disclosure is equally applicable for

determining an option premium for each vertical slice).

Daughtery does not specifically disclose volatility of volatility. Examiner

recognizes that this term is old and well known in the art. To add further support,

Examiner cites Chriss disclosing this feature (pages 343-349). Therefore, it would have

been obvious for a person having ordinary skills in the art at the time the invention was

made to modify the disclosure of Daughtery to include the disclosure of Chriss. One

would have been motivated to do so in order to address the randomly changing volatility

as illustrated by Chriss (page 345).

Both Daughtery and Chriss fail to specifically disclose

providing the type of distribution for the forward rate based on historical data.

However, Pilipovic discloses this feature (col. 4, lines 40-55, col. 18, lines 54-63,

col. 19, lines 5-20).

Therefore, it would have been obvious to a person having ordinary skills in the art at the time the invention was made to modify the disclosure of Daughtery and Chriss to include the disclosure of Pilipovic. The motivation for combining these references would be to create distributions of possible outcomes for any forward rate and for any period in the future as illustrated by Pilipovic (col. 18, lines 54-63).

Daughtery, Chriss and Pilipovic fail to specifically disclose

providing a volatility distribution graph based on the selected distribution type, the volatility and the volatility of volatility, the graph having volatility as the x-axis and probability as the y-axis;

dividing the volatility distribution graph into a plurality of vertical slices, each of said slices corresponding to a volatility, whereby the integration of the graph over the volatility range corresponding to each slice provides a probability for the corresponding volatility;

Examiner recognizes that providing a distribution graph and dividing the distribution graph into a plurality of vertical slices is old and well known in the art. For example, a spreadsheet program e.g. Excel would be able to meet these limitations and is clearly within the capability of a person having ordinary skills in the art. However, to add further support, Examiner cites Yuguchi disclosing these features (Figure 1A and 1B and claim 1).

Therefore, it would have been obvious to a person having ordinary skills in the art at the time the invention was made to modify the disclosure of Daughtery, Chriss and Pilipovic to include the disclosure of Yuguchi. The motivation for combining these

references would have been to display the data graphically and would have been within the knowledge of a person having ordinary skills in the art.

Examiner has given little/no patentable weight to the limitations

weighing each premium from said determining of premium step by the probability associated with the corresponding volatility as determined from the volatility distribution graph; and

summing all weighed premiums associated with the volatilities to provide a premium for the option.

Examiner notes that the limitation weighing each premium... is simply multiplying the premium calculated in the previous step with the probability factor. This limitation does not change the scope of the claim and produces an expected outcome.

Similarly, arguments can be made that the limitation summing all weighted premium...simply produces an expected outcome.

Regarding the limitation, wherein the volatility premium process used to determine the stochastic volatility premium incorporates a trader-selected q to calculate the value of a call option on rate r with forward value $^{-}$r, strike k, expiration time t, and annualized volatility σ and is given by the following formula as disclosed in claim 2.

Examiner notes that Applicant's admitted prior art discloses (Remarks, dated 4/14/2008, page 8) that "Mathematical techniques are known in the financial and other arts that implement a selectable "q"".

In response to 37 C.F.R. §105 request, Applicant states that the equation of claims 2, 4, and 7 is derived from existing equations. Applicant did not clearly state

where the existing equations can be found. Since, the office is not able to search for

mathematical equations, Examiner is relying on Applicant to provide this information as

per 37 C.F.R. 105 request. Based on the information provided by Applicant, Examiner

concludes that the mathematical equations cited in claims 2, 4 and 7 are not novel and

it would have been obvious to a person having ordinary skills in the art to derive the

mathematical equations cited in claims 2, 4 and 7 from existing equations. If Applicant

does not agree with Examiner's interpretation of Applicant's disclosure as per 37 C.F.R.

§ 105, Examiner encourages the Applicant to clearly specify how these equations would

not have been obvious to a person having ordinary skills in the art.

Therefore, it would have been obvious to a person having ordinary skills in the art

at the time the invention was made to modify the disclosure of Daughtery, Chriss,

Pilipovic and Yuguchi to include the disclosure of Applicant's admitted prior art. The

motivation for combining these references would be to determine expirationless option

premium as illustrated by Daughtery (col. 11, lines 20-30).

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over

Daughtery in view of Chriss in view of Pilipovic in view of Yuguchi in view of Applicant's

admitted prior art and further in view of a non-patent literature titled Financial

Engineering News. Daughtery discloses a method for generating a premium for an

option, comprising:

providing the average volatility of the asset by employing historical or market

data (col. 7, lines 1-8);

providing the *volatility of volatility* of the asset by employing historical data (col. 7, lines 1-8);

determining an option for each vertical slice by employing a volatility premium process (col. 11, lines 35-col. 12, lines 13, Daughtery disclosure is equally applicable for determining an option premium for each vertical slice).

Daughtery does not specifically disclose volatility of volatility. Examiner recognizes that this term is old and well known in the art. To add further support, Examiner cites Chriss disclosing this feature (pages 343-349). Therefore, it would have been obvious for a person having ordinary skills in the art at the time the invention was made to modify the disclosure of Daughtery to include the disclosure of Chriss. One would have been motivated to do so in order to address the randomly changing volatility as illustrated by Chriss (page 345).

Both Daughtery and Chriss fail to specifically disclose

providing the type of distribution for the forward rate based on historical data.

However, Pilipovic discloses this feature (col. 4, lines 40-55, col. 18, lines 54-63, col. 19, lines 5-20).

Therefore, it would have been obvious to a person having ordinary skills in the art at the time the invention was made to modify the disclosure of Daughtery and Chriss to include the disclosure of Pilipovic. The motivation for combining these references would be to create distributions of possible outcomes for any forward rate and for any period in the future as illustrated by Pilipovic (col. 18, lines 54-63).

Daughtery, Chriss and Pilipovic fail to specifically disclose

providing a volatility distribution graph based on the selected distribution type, the volatility and the volatility of volatility, the graph having volatility as the x-axis and probability as the y-axis;

dividing the volatility distribution graph into a plurality of vertical slices, each of said slices corresponding to a volatility, whereby the integration of the graph over the volatility range corresponding to each slice provides a probability for the corresponding volatility;

Examiner recognizes that providing a distribution graph and dividing the distribution graph into a plurality of vertical slices is old and well known in the art. For example, a spreadsheet program e.g. Excel would be able to meet these limitations and is clearly within the capability of a person having ordinary skills in the art. However, to add further support, Examiner cites Yuguchi disclosing these features (Figure 1A and 1B and claim 1).

Therefore, it would have been obvious to a person having ordinary skills in the art at the time the invention was made to modify the disclosure of Daughtery, Chriss and Pilipovic to include the disclosure of Yuguchi. The motivation for combining these references would have been to display the data graphically and would have been within the knowledge of a person having ordinary skills in the art.

Examiner has given little/no patentable weight to the limitations

weighing each premium from said determining of premium step by the probability associated with the corresponding volatility as determined from the volatility distribution graph; and

summing all weighed premiums associated with the volatilities to provide a premium for the option.

Examiner notes that the limitation weighing each premium... is simply multiplying the premium calculated in the previous step with the probability factor. This limitation does not change the scope of the claim and produces an expected outcome.

Similarly, arguments can be made that the limitation summing all weighted premium...simply produces an expected outcome.

Daughtery, Chriss, Pilipovic and Yuguchi do not specifically disclose performing an inverse Black procedure to determine the conventional market implied volatility for a strike rate that is different from the forward rate. Examiner recognizes this limitation to be old and well known in the art. It is Examiner's interpretation that Applicant recognizes this as well (specification page 5, lines 5-7). Arguments can be made that performing the inverse Black procedure does not change the scope of the claim. As per Applicant's disclosure (Remarks, dated 4/14/2008, pg. 12), that Daughtery already achieves this goal and can't possibly "invert" an equation it has already implemented to achieve a result that it has already reached without any inversion." Thus, Examiner asserts that Daughtery accomplishes what Applicant is claiming by incorporating the inverse Black step. However, to add further support, Examiner cites Financial Engineering News disclosing this feature.

Therefore, it would have been obvious for a person having ordinary skills in the art at the time the invention was made to modify the disclosure of Daughtery, Chriss, Pilipovic and Applicant's admitted prior art to include the disclosure of Financial

Engineering News. One would have been motivated to do so in order to yield smooth

volatility surfaces as illustrated by Financial Engineering News.

Claims 4 and 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Pilipovic in view of Chriss in view of Daughtery in view of Applicant's admitted prior

art. Pilipovic discloses a method for generating a premium for an option, said option

associated with volatility, a volatility of volatility, and a distribution type, said method

comprising:

providing a volatility distribution based on said volatility, said *volatility of volatility*,

and said distribution type (claim 36, col. 4, lines 40-55, col. 18, lines 54-63, col. 19, lines

5-20);

Pilipovic does not specifically disclose volatility of volatility. Examiner recognizes

that this term is old and well known in the art. To add further support, Examiner cites

Chriss disclosing this feature (pages 343-349). Therefore, it would have been obvious

for a person having ordinary skills in the art at the time the invention was made to

modify the disclosure of Pilipovic to include the disclosure of Chriss. One would have

been motivated to do so in order to address the randomly changing volatility as

illustrated by Chriss (page 345).

Both Pilipovic and Chriss fail to specifically disclose

determining an option premium for each volatility portion by employing a volatility

premium process.

However, Daughtery discloses this feature (col. 11, lines 35-col. 12, lines 13).

Therefore, it would have been obvious to a person having ordinary skills in the art at the time the invention was made to modify the disclosure of Pilipovic and Chriss to include the disclosure of Daughtery. The motivation for combining these references would be to determine expirationless option prices as illustrated by Daughtery (col. 11, lines 20-30).

Pilipovic, Chriss and Daughtery fail to specifically disclose

dividing the volatility distribution into a plurality of portions, each said portion corresponding to a volatility, each said portion being associated with a probability;

Examiner recognizes that dividing the volatility distribution into a plurality of portions is old and well known in the art. For example, a spreadsheet program e.g. Excel would be able to meet these limitations and is clearly within the capability of a person having ordinary skills in the art. However, to add further support, Examiner cites Yuguchi disclosing these features (Figure 1A and 1B and claim 1).

Therefore, it would have been obvious to a person having ordinary skills in the art at the time the invention was made to modify the disclosure of Pilipovic, Chriss and Daughtery to include the disclosure of Yuguchi. The motivation for combining these references would have been to display the data graphically and would have been within the knowledge of a person having ordinary skills in the art.

Examiner has given little/no patentable weight to the limitations

weighing each option premium by the probability associated with said volatility portion; and

summing all weighed premiums associated with said volatility portions to provide a premium for the option.

Examiner notes that the limitation weighing each premium... is simply multiplying the premium calculated in the previous step with the probability factor. This limitation does not change the scope of the claim and produces an expected outcome.

Similarly, arguments can be made that the limitation summing all weighted premium...simply produces an expected outcome.

Regarding the limitation, wherein the volatility premium process used to determine said option premium for each said volatility portion uses a selectable q parameter, and wherein the value of a call option on rate r with forward value $\overline{r}$, strike k, expiration time t, and annualized volatility σ and is given by the following formula as disclosed in claim 4.

Examiner notes that Applicant's admitted prior art discloses (Remarks, dated 4/14/2008, page 8) that "Mathematical techniques are known in the financial and other arts that implement a selectable "q"".

In response to 37 C.F.R. §105 request, Applicant states that the equation of claims 2, 4, and 7 is derived from existing equations. Applicant did not clearly state where the existing equations can be found. Since, the office is not able to search for mathematical equations, Examiner is relying on Applicant to provide this information as per 37 C.F.R. 105 request. Based on the information provided by Applicant, Examiner concludes that the mathematical equations cited in claims 2, 4 and 7 are not novel and it would have been obvious to a person having ordinary skills in the art to derive the

mathematical equations cited in claims 2, 4 and 7 from existing equations. If Applicant

does not agree with Examiner's interpretation of Applicant's disclosure as per 37 C.F.R.

§ 105, Examiner encourages the Applicant to clearly specify how these equations would

not have been obvious to a person having ordinary skills in the art.

Therefore, it would have been obvious to a person having ordinary skills in the art

at the time the invention was made to modify the disclosure of Pilipovic , Chriss and

Daughterty and Yuguchi to include the disclosure of Applicant's admitted prior art. The

motivation for combining these references would be to determine expirationless option

premium as illustrated by Daughterty (col. 11, lines 20-30).

Claims 6-7 are substantially similar to claim 4 and hence rejected on similar

ground.

Claims 5 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Pilipovic in view of Chriss in view of Daughterty in view of Applicant's admitted prior art

and in view of a non-patent literature titled Financial Engineering News. Pilipovic,

Chriss and Daughterty disclose the invention as described above. All fail to disclose the

limitation performing an inverse Black procedure to determine the conventional market

implied volatility for a strike rate that is different from the forward rate. Examiner

recognizes this limitation to be old and well known in the art. It is Examiner's

interpretation that Applicant recognizes this as well (specification page 5, lines 5-7).

Arguments can be made that performing the inverse Black procedure does not change

the scope of the claim. As per Applicant's disclosure (Remarks, dated 4/14/2008, pg.

12), that Daughterty already achieves this goal and can't possibly "invert" an equation it

has already implemented to achieve a result that it has already reached without any inversion." Thus, Examiner asserts that Daughtery accomplishes what Applicant is claiming by incorporating the inverse Black step. However, to add further support, Examiner cites Financial Engineering News disclosing this feature.

Therefore, it would have been obvious for a person having ordinary skills in the art at the time the invention was made to modify the disclosure of Pilipovic, Chriss, Daughtery and Applicant's admitted prior art to include the disclosure of Financial Engineering News. One would have been motivated to do so in order to yield smooth volatility surfaces as illustrated by Financial Engineering News.

Claim 8 is substantially similar to claim 5 and hence rejected on similar ground.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to RAJESH KHATTAR whose telephone number is (571)272-7981. The examiner can normally be reached on Flex schedule.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Kramer can be reached on 571-272-6783. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information

system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/James A. Kramer/
Supervisory Patent Examiner, Art Unit 3693

/R. K./
Examiner, Art Unit 3693